

Promoting a Scholar Identity in African American Males: Recommendations for Gifted Education

Gilman W. Whiting

**Peabody College of Education
Vanderbilt University**

What does it mean to be “gifted” or “talented”? How do we define and identify “potential”? Does the gifted/talented child have a certain look? Is giftedness the domain of one group rather than another? Is giftedness American or Asian? Does age matter? How about socio-economic status? Does race or ethnicity matter? Is a 2-year-old who manages to survive home alone for more than two weeks “gifted” (CNN, September 2003)? Is this same child gifted only if she has a large vocabulary? Is she gifted if she doesn’t read at an early age? Is she gifted if, once in 4th grade, she makes Ds in school? Must students demonstrate their giftedness or can it be developed? What role and to what degree does home/environment, community, mentoring/teacher/coaching influence talent development, potential, giftedness? In essence, how do we determine who is “gifted” and who requires gifted education services? Do any of the above characteristics matter when we are making referrals for gifted education screening and testing?

These are important questions to consider as we discuss and consider the under-representation of Black students in gifted education programs. And given that Black males tend to be more under-represented in gifted education than other students (Elementary and Secondary Civil Rights Survey, 2000), these questions are even more critical for educators to consider. Nationally, statistics reveal that Black males comprise 8.37% of school districts nationally, but 3.54% of gifted programs (Elementary and Secondary Civil Rights Survey, 2000). Tragically, Richert (as cited in Ford, 1996) reported that Black males are under-represented by about 600% in some gifted programs. Thus, while educators are rightfully concerned with the most effective ways to identify gifts and talents in students, the needs seem to be most critical or urgent when it comes to Black males.

In this brief paper, I offer another perspective on giftedness among Black males, arguing in particular that talent development ideologies and the promotion of a scholar identity are two promising ways to increase the representation of Black males in gifted programs. In addition, I propose a few strategies for addressing these recommendations. First, however, I begin with a discussion of cherry picking, which begs the question: How do some individuals get selected for gifted programs while others do not?”

Cherry Picking: Availability, Choice and Opportunity

I have watched the selection process of sports all my life. I was

always one of the first chosen (fortunately, for the sake of my developing sense of self-worth). For many years, I took part in a ritual of selecting or providing the opportunity to choose the ‘best’ person.

Captain 1: Hey, I made the shot. I got first pick. Marvin, I got you.

Captain 2: Man, you always take Marvin.

Captain 3: Well, you should learn to shoot better. Then, you can pick first.

Group: Chuckles.

Captain 2: Alright, I got Damion. Next time, you can’t pick Marvin.

Captain 1: Whatever, man. Y’all got the ball first.

There is a certain amount of self-esteem the person of choice receives from not only being selected first amongst others, but subsequently feeling that others were thinking of and wanting to provide him/her with the opportunity to further distinguish herself/himself. In this example, the person: (1) knows that he/she is needed; (2) does not have to think about the reason for the selection; and (3) feels that his/her very being has allowed the game to be played and this is motivating.. The selected person has no need to feel or think about things like, “What if someone else were there, would I still have been selected?” The talent he/she possesses can now be nurtured, even in this subjective, value-laden arena. Now let’s compare the above-illustrated selection opportunity for a sport’s team to that of being selected for a gifted education class. What does this cherry picking look like in a school setting?

Mrs. White: Now class, remember at least two on a team, no more than three. You will have 30 seconds to give the correct answer. You have two minutes to pick your teams. Dona and Marvin, you are the captains. You pick the teams ... (Secretly, Mrs. White selects Dona because she believes her to be the “brightest in the class,” and selects Marvin because he, although an outstanding athlete, is always the last to be selected for academic games). ... Marvin, you pick first.

Marvin is a gifted athlete and an “average” student. Mrs. White is a middle-class White woman¹ who actually thinks Marvin is less than average academically. She is attempting to keep him engaged in the learning process. Unfortunately, she has been

¹ Many reports indicate that over 90% of the teaching profession is White, and most of them are females.

quantity of friends. He wants to have friends, but he is not obsessed or overly concerned about being popular for the sake of popularity. He understands that the need for achievement is a powerful motivator, one that will take him far (or farther) in life than being extremely social or popular. So, he does not sacrifice school work for friendships or a social life. School comes first.

⑧ **Academic Self-Confidence** – The Black male here believes that he is a good student, a smart student. He feels comfortable and confident in academic settings. Thus, he is willing to raise his hand in class, to ask questions, and to acknowledge that he does not know the answer. Most importantly, he does not feel inferior in class; he does not feel that he must hide his academic abilities and skills. This student also has a strong work ethic and recognizes that hard work pays off. For example, Black males with a strong work ethic take time with school work, they study, and they require few nudges from adults. In essence, the student recognizes that to be successful, effort is just as important, or more important, than ability.

⑨ **Racial Identity and Pride** – It is impossible to talk about a racial identity without considering self-perception (i.e., self-esteem and self-concept). Most educators support the notion that self-perception influences students' achievement and motivation. Likewise, when one is a person of color, we must also consider racial identity and pride. Black males who have a scholar identity have a positive and strong racial identity (Cross & Vandiver, 2001). Race, in other words, has high salience in their lives. Just as important, they do not equate achievement with 'acting white' or 'selling out' (Ferguson, 2001; Ford, 1996; Fordham, 1988). They recognize, as we all must, that any group can achieve, regardless of gender, socio-economic status, race or ethnicity.

⑩ **Masculinity** – The issue of masculinity is a sensitive one. Here, I refer only to the sense that Black males with a scholar identity do not equate being intelligent or studious or talented with being 'feminine' or 'unmanly.' Instead, they believe that males are intelligent and that being gifted does not detract from one's sense of masculinity.

Recommendations: Promoting a Scholar Identity Among Black Males

Just as many Black males find their sense of self-worth (self-esteem, self-concept, self-efficacy, and racial identity) in non-academic settings, they can and must find their self-worth in school settings – a place where they spend at least 13 years. Clearly, parents and primary care givers lay the foundation for self-worth; just as significant, educators must understand and accept the reality that they are more than just people who teach math, reading, and science. Teachers play a major role in the formation of students' sense of self, including the students' scholar identity. How do we promote a scholar identity among Black males, so many of whom feel marginalized in school settings, so many of whom feel that they are unintelligent and incapable of succeeding in rigorous courses?

Talent Identification and Development

Identifying and nurturing talent is a cornerstone of gifted education. The U.S. Department of Education gave educators a new perspective on the notion of giftedness and talent with its 1993 definition. The definition recognizes that some students demonstrate their talents while others have the potential to do so with time, commitment, support and nurturance. The definition is long overdue and represents a timely recognition that children from economically advantaged backgrounds, for example, have more opportunities to develop their talents than others; the definition also recognizes that access and support go a long way in developing talent among all students, but particularly those with the least amount of support and access. Namely, given that Black students are disproportionately represented among children who live in poverty and are highly likely to face low teacher expectations, they are less likely to have access to critical education-related resources and supports.

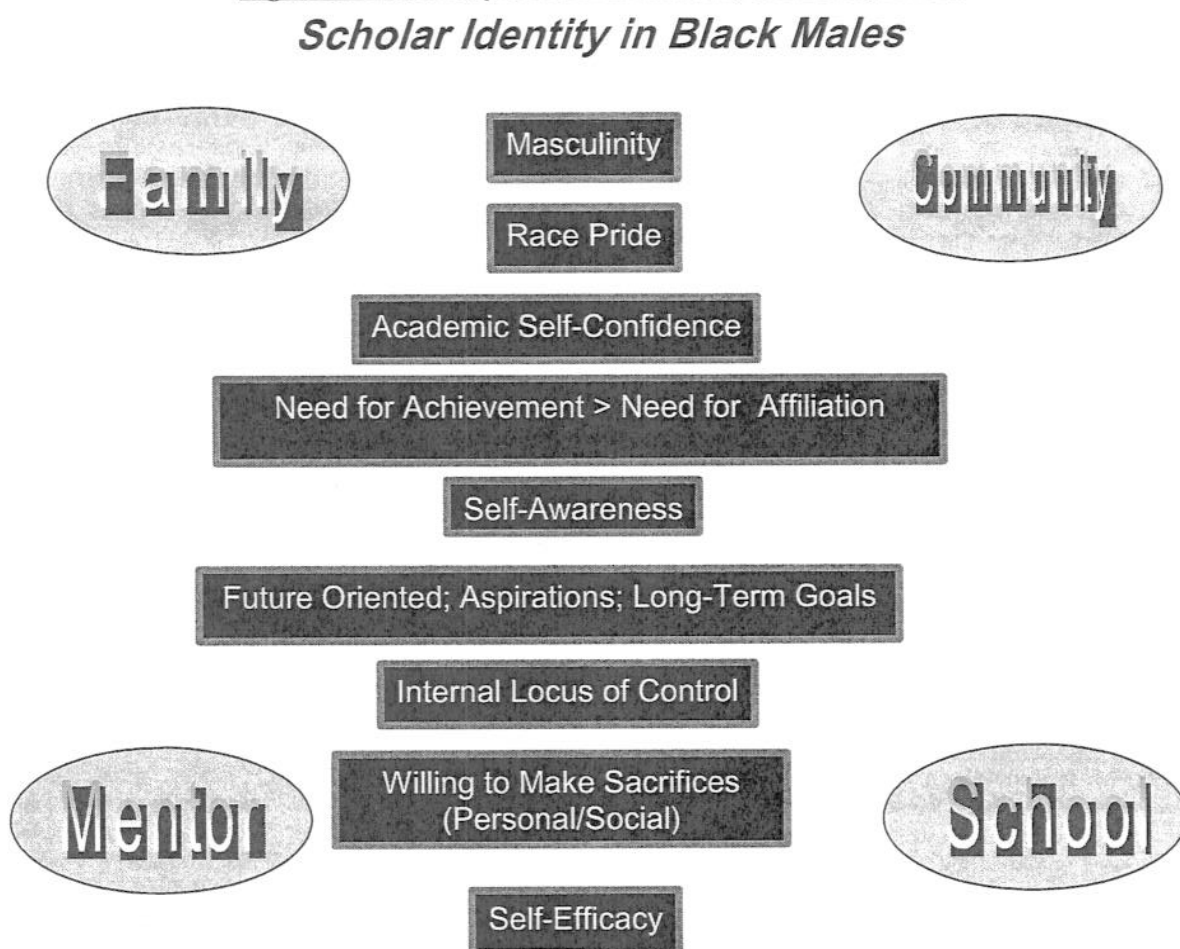
Talent development is guided by the notion that lack of opportunity and limited access to resources and supports can undermine one's abilities, skills, and achievements. Thus, educators will need to close, very early, these resource and opportunity gaps for Black males. With young Black males in mind, educators should consider developing preschool programs that have an academic focus as one way to expose Black males to the knowledge, skills and competencies they will need to be successful throughout their formal school years. For older students, talents can be developed with mentors and role models.

Mentors and Role Models

Mentors and role models have always played central roles in developing gifts and talents. Educators can work with such organizations as fraternities, 100 Black Men, Urban League, Boys and Girls Clubs, and others to find Black males to serve as mentors and role models for Black male students. These men can focus on: (a) gaining leadership skills; (b) exploring definitions of manhood; (c) building relationships; (d) resolving conflicts and managing anger; (e) coping with social injustices; (e) developing or refining learning strategies and techniques (e.g., study skills, organizational skills, time management skills); (f) exploring career interests; (g) enhancing social skills; (h) acquiring soft skills; and (i) building networks. For Black males at the secondary level, mentors can also provide exposure to college settings (campus visits, college tours) and internships.

Peer-to-peer mentoring is another promising strategy. This might include younger Black males working with slightly older Black males who have been successful in school (e.g., class valedictorians and salutatorians, members of National Honor Society, high GPA) for similar types of experiences as those just described.

Figure 1: Hierarchy of Scholar Identity (Whiting, 2006)



Under-Representation of Diverse Students in Gifted Education: Recommendations for Non-Discriminatory Assessment: Part 2

Gilman W. Whiting and Donna Y. Ford

**Peabody College of Education
Vanderbilt University**

In the Spring 2006 issue of *GEPQ*, we presented an overview of some key components of non-discriminatory assessment, with particular attention to the concept of assessment. The overall goal of non-discriminatory assessment, as we see it, is to eliminate or reduce (as much as possible) biases in instruments, policies, procedures, and practices. Such improvements will likely result in an increased presence of culturally and linguistically diverse (CLD) students in gifted education. Specifically, we contend that when interpreting the test scores of

CLD students, educators must gather two important and interrelated pieces of information: (1) the examinee's level of acculturation; and (2) the degree to which performance on the test is contingent upon culture-specific knowledge and experiences.

We argued then, as we do now, that educators and others interested in measuring the intelligence of culturally and linguistically diverse students must create a greater awareness of

Thus, educators must have an understanding of the concept of 'culture,' including values, beliefs, customs, traditions, communication styles, and more (Ford & Harris, 1999), and how these dimensions of culture affect test performance (see Helms, 1992). It is also important to have at least one member of the assessment team who has formal training in cross-cultural assessment and/or is from the same culture as the diverse individual being assessed. (For research on this principle, readers are referred to a recent study (Sommers, 2006) of how racial diversity improves group decision making.)

Principle 8: Make comparisons with students' contexts and demographics in mind. Cultural and linguistic differences serve to artificially *depress* the scores of diverse individuals. Thus, the less acculturated the student or examinee, the lower the test score is likely to be. Further, the more cultural and linguistic demands of the test, the greater the probability that diverse individuals will have lower test scores than mainstream individuals. It is necessary, therefore, when making group comparisons to consider the differences in the groups relative to cultural background and language skills. Hypotheses regarding the nature and extent of group differences should include considerations of culture and language (Ortiz, 2002). Further, CLD students must not be penalized for their cultural and linguistic differences by being denied access to challenging curriculum and gifted education programs.

Principle 9: Consider different group norms when interpreting results. No matter how much a test developer might want to emphasize the fairness of a given test by illustrating the inclusion of racially or ethnically diverse individuals, claims about equity are highly misleading and inaccurate (Valdes & Figueroa, 1994). Practitioners should, thus, be careful not to fall prey to the assumption that stratification in the norm sample on the basis of race is equivalent to stratification on the basis of culture (p. 227). If different groups have different group norms on intelligence tests, then those subgroup norms should be considered when making decisions (e.g., placement, grouping).

Principle 10: Where appropriate and possible, make accommodations or modifications. Proper and systematic consideration of the relevant cultural and linguistic characteristics of tests provides a framework for interpretation that is more valid and reliable than what is ordinarily obtained using traditional methods (Flanagan & Ortiz, 2001, p. 255). Appropriate assessment must involve a determination of how well any particular assessment situation matches the practices that individuals experience as part of the culturally-contextualized activities (Miller-Jones, 1989, p. 363). In this regard, practitioners must consider ways to accommodate differences (e.g., translated tests, language interpreter, non-verbal tests, authentic assessments, etc.).

Principle 11: Assume normality as much as possible when conducting an assessment. When test scores are low, there may be a tendency to focus on shortcomings, which may have a negative influence on our decisions. The assumption of normality should guide the assessment process; when the process of assessment or evaluation is guided with the presumption of normality, this assumption reduces the tendency to search for

data or "see" patterns of dysfunction where none may exist (Ortiz, 2002, p. 1323).

Principle 12: Use tests to enhance learning and support students. The greater the difference between an individual's cultural or linguistic background and the cultural or linguistic background of individuals comprising the norm group, the more likely the test will measure lower performance as a function of this *experiential* difference as opposed to being due to actual lower ability (Flanagan & Ortiz, 2001, p. 259). The very purpose of assessment should be to enhance learning rather than simply to diagnose the causes of poor performance (Ortiz, 2002). Thus, to close the test performance gap between diverse and White students, and to improve the test performance of diverse individuals, educators will need to improve the quality of the schooling and educational experiences. Such experiences include, for example, providing students assistance in test-taking skills, study skills, listening skills, and language- or literacy-based instruction.

When considered collectively, these principles suggest that practitioners must consider that the research that overwhelmingly supports the notion that intelligence tests are not biased is based on definitions of bias that are either untenable or inaccurate. Bias is not a function of simply item content, factor structure, or racial differences. Bias is more a function of differences in experience that are due to factors involving many variables, including culture and language (Flanagan & Ortiz, 2001, p. 266). Thus, the absence of technical bias in intelligence tests in no way absolves those who administer and make decisions based on those tests from socially responsible decision making (Skiba, Knesting, & Bush, 2002, p.75).

In the final analysis, non-discriminatory assessment is much more than ensuring that tests are unbiased. Rather, such assessment represents a commitment to data collection...[and] assists in identifying and eliminating sources of bias throughout the educational process (Skiba, Knesting, & Bush, 2002, p. 62).

Implications for Gifted Education

As we proposed in Part 1, non-discriminatory assessment holds much promise for increasing the representation of culturally and linguistically diverse students in gifted education. To address the issue of diverse students being under-represented in gifted education, educators must carefully select tests and instruments. Several final recommendations are offered.

First, educators must develop hypotheses to study and explain group differences on the test performance of gifted diverse students. What factors account for their differential test scores?

Second, tests, other instruments (e.g., checklists, nomination forms, referral forms, etc.), and policies and procedures (e.g., teacher referrals) must be examined for possible disparate impact. How do they contribute to minority student under-representation? For instance, if teachers tend not to refer diverse

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Giftedness and ADHD: Overlapping Characteristics and Problems in Diagnosis and Treatment

Rebecca Gray and Sherry K. Bain
University of Tennessee-Knoxville

As school-based mental health professionals, we have occasionally heard an educator-colleague report that one of his or her brightest students is easily distracted or inattentive, is restless and even disruptive at times, and is having significant trouble getting along with peers. Each of these characteristics is common among children with Attention Deficit Hyperactivity Disorder (ADHD) and raises a flag of concern about the child having dual exceptionalities, giftedness and ADHD. In addition, highly gifted children without ADHD are sometimes noted for displaying over-excitability, which may show up in the form of psychomotor restlessness, flights of fantasy or daydreams, or oversensitivity in peer relationships, again puzzling their parents or teachers who are looking for individualized solutions to each child's needs. Because of overlapping characteristics in giftedness and ADHD, making a correct diagnosis can be challenging, resulting in frequent misdiagnosis (Flint, 2001).

We developed this literature review for parents and educational professionals who work with children who are gifted, and who are interested in correctly identifying children who are gifted and have ADHD. During the course of a graduate class that introduces future school psychologists to issues in assessment and treatment of children with special needs, we discovered that there was little in the refereed literature on the topic of children with dual diagnoses of ADHD and giftedness. Among the current literature offerings are two recent studies that offer rare data-based results for children with giftedness and ADHD. Both focus only on males, reflecting the relative frequency of ADHD among boys (Moon, Zentall, Grskovic, Hall, & Stormont, 2001; Zentall, Moon, Hall, & Grskovic, 2001). Other recent journal sources offer general information regarding cautions in diagnosis and intervention (e.g., Flint, 2001; Hartnet, Nelson, & Rinn, 2004). What follows is our generalized summary of this literature. First we will provide a brief overview of characteristics often found in children with ADHD, and then we will compare these with similar characteristics often found in children who are gifted. Finally, we will summarize some of the

recommendations for diagnosis and treatment of children with ADHD and giftedness.

Characteristics of Children with ADHD

Characteristic behaviors associated with ADHD are among the most common reasons children are referred to mental health professionals (Hartnett et al., 2004). Children with ADHD are characterized by a set of behaviors that prevent them from performing to their fullest potential in the classroom, often being highly distractible with little provocation, having difficulty following instructions, being unable to sustain attention levels appropriate to the situation, and displaying tendencies to start new projects while not completing existing ones (Flint, 2001). Hyperactivity, impulsivity, poor social skills, underachievement, and low frustration tolerance are among the primary characteristics sought in assessment and diagnosis. Hyperactivity, specifically, is described as constant motion, or random energy, which can manifest itself in different ways, from running and touching to squirming restlessly (Leroux & Levitt-Perlman, 2000). In order to receive a diagnosis, problem behaviors must be pervasive, long lasting, and interfere significantly with daily responsibilities (Flint, 2001).

There are several additional characteristics common to children with ADHD that can affect classroom success. These students typically have poor visual-motor skills and poor handwriting, sometimes associated with trying to work too fast. In regards to Language Arts activities, these students often dislike reading and have trouble with planning, writing, and editing. They also do not do well in areas in which they are required to wait, work independently, or read from textbooks (Zentall, et al., 2001).

According to Barkley, the consensus of expert opinion is that 3-5% of the childhood population has ADHD (1998). Needless to say, a large number of students with ADHD fail a grade in school by the time they reach adolescence and many fail to finish high school (Zentall et al., 2001).

Zentall and colleagues (2001) have presented evidence that high intelligence can make some of the problems of ADHD more apparent to teachers, who have reported discouragement in working with these students and described them, generally, as having poor work ethics.

Because of the similarities that exist between children with either diagnosis, a careful and thorough assessment should be completed before either diagnosis is applied to a child. Several factors increase the difficulty of making a correct diagnosis. For example, being gifted does not exempt a student from inconsistent performance. Many students with both ADHD and giftedness function at a high level one day, then fail on another day. Unfortunately, it may be the case that the successful days, the good days, go unnoted and unrewarded. Gifted children with ADHD also require highly stimulating, challenging material to keep their attention (Flint, 2001). If given curricula that they find uninteresting, these children will sometimes shut down. As with most children, those who are gifted may have some subjects that they love and others they do not care about. If not interested, gifted students with or without ADHD may not apply themselves, leading to underachievement and resulting in an informal judgment of average or below-average ability.

Another problem that may exacerbate the confusion in diagnosis is that gifted children with ADHD may exhibit an even wider than normal discrepancy between their intellectual age and social or emotional age, with noticeably underdeveloped social skills that may again mask any consideration of giftedness (Flint, 2001). Until careful assessment can give every child the chance for appropriate and correct diagnosis, many of these children will not have the opportunity to be understood or challenged (Leroux et al., 2000).

Treatment for Gifted Students with ADHD

The literature from experts in the diagnosis and treatment of ADHD offers several suggestions for those working with students who are gifted and have ADHD. These include attention to the individual academic, social, and emotional needs of the child, medication to address symptoms of ADHD, and behavioral interventions including self-management techniques.

Most students respond well to teachers who are kind and who value them as individuals. Gifted students and students with ADHD are no exception. Having teachers who give students individual attention and take personal interest in them can increase motivation (Zentall, et al., 2001). Underachievement may be remedied by teachers who are accepting of the child's eccentricities and who provide a rich, stimulating environment that focuses on the child's interests. Gifted students are typically intrinsically motivated; therefore, internal reinforcement will often automatically follow when students are active in selecting their own goals (Flint, 2001). For instance, a musically gifted child might react more positively to writing a song about the environment than writing an essay on the topic. Generally, teachers and parents are advised to recognize and celebrate the

strengths while identifying and remediating the weaknesses of students (Leroux & Levitt-Perlman, 2000).

Teachers and parents should also be aware of the special needs in the social and emotional domains for students with ADHD and giftedness. They may need help in coping with frustration, developing friendships, and working effectively with peers on group projects (Moon et al., 2001). School mental health professionals, such as counselors and school psychologists can be valuable in providing these services. It is important that skills be taught to assist these students in social relationships, for these skills can facilitate the child's functioning in several areas of life (Leroux & Levitt-Perlman, 2000).

Medication is the most common treatment for children with ADHD. In fact, more children receive medication to manage ADHD than any other childhood disorder. Medications can lead to an average improvement rate of between 50% and 95% among those treated. Many studies have found that medication can enhance performance on measures of vigilance and improve impulse control, fine-motor coordination, reaction time, and short-term memory. Medication has also been shown to have positive effects on the ability to sustain attention to assigned tasks and to reduce task-irrelevant restlessness and motor activity. The quality of social interactions between children with ADHD and their parents, peers, and teachers can be significantly improved by medication. However, medications for ADHD may have some adverse effects, such as depressed mood, weight loss, and induction of tics. As well, medications do not always bring about desired changes for every child (Barkley, 1998).

In the psychological literature, many studies have demonstrated success rates when medication is included with additional treatment such as behavior modification. For example, one study found that behavior modification techniques enhanced the effects of medication in children with ADHD during athletic activities (Reitman, Hupp, O'Callaghan, Gulley, & Northup, 2001). The greatest improvements in attentive behavior were observed when medication and behavior modification were combined; in addition, disruptive behavior decreased with the combined interventions (Reitman, 2001).

A variety of behavioral interventions have been used to modify behavior. Some of these include teacher-administered and peer-administered consequences, home-based consequences, cognitive-behavioral interventions, social skills training, and parent training. To be effective, most behavioral interventions require accurate record-keeping, monitoring and administration of rewards and/or negative consequences. The success of these types of interventions requires a high level of cooperation between school personnel, parents, and consultants (Barkley, 1998).

Self-management interventions have also been successfully used with students who have ADHD (e.g., Hinshaw, 2005; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999). These techniques involve self-monitoring, self-reinforcement, self-

The lessons in courage are clearly illustrated in these passages and excerpts, and it would be incumbent upon gifted students to study some of them to prepare for the dangerous times ahead. By writing their own interpretations of the people and events presented in **American Courage**, gifted students can acquire a better understanding of the American people during national crises and active periods in the nation's development. Moreover, it would be useful for them to identify their own excerpts in American courage by reading other books and articles to supplement and expand upon Warden's fine work. The following is one of Warden's comments presented before a particular excerpt: "TO THE INTELLIGENCE AGENCIES of the USA and Great Britain the choice was obvious. In early 1941, 'Cynthia' (her code name) had already delivered to M16 the cipher books of the Italian Navy, which helped the Royal Navy defeat a superior Italian fleet in Cape Matapan, Greece. Further, she had inveigled a Polish foreign-affairs officer to show her a Nazi map of Adolf Hitler's plans to dismember Czechoslovakia." (From Chapter 39: WANTED: An Elegant Female Spy to Bribe or Seduce Top Officials at Nazi - Controlled, Vichy French Embassy, p. 288)

Paul Johnson's Study of Creative Individuals

Michael E. Walters

Center for the Study of the Humanities in the Schools

"When I was a boy I used to lie on my back for hours watching the skies, and then go home and paint them; . . ." (J.M.W. Turner, quoted by Paul Johnson in **Creators**, 2006, p. 94, HarperCollins)

A recent book by the British social critic and historian, Paul Johnson, is essential for educators and parents of gifted individuals to read. It is a collection of essays with each chapter discussing the life and work of one or more artists. There are three concepts that Johnson develops that can be used in the gifted education curriculum. The first is an understanding of the humanities as a source for the content of this curriculum. Johnson's subjects show the different areas of human activities encompassed by the humanities. The individuals he examines in detail are from such disciplines as literature (Chaucer, Shakespeare, Jane Austen, Victor Hugo, Mark Twain, and T.S. Eliot), art (Albrecht Dürer, J.M.W. Turner, Hokusai, and Picasso), music (J.S. Bach), architecture (A.W.N. Pugin and Eugène Viollet-le-Duc), decorative arts (Louis Comfort Tiffany), fashion (Cristóbal Balenciaga and Christian Dior), and animation (Walt Disney). He also discusses many other highly creative people associated with each discipline. Johnson is especially helpful in showing how these disciplines contribute insights that enable a creative individual to perceive the linkage between multiple forms of creativity. For example, poets can be influenced by techniques in music such as counterpoint.

The second concept Johnson emphasizes is an awareness of the attributes of sensibility that allowed each of these creative individuals to overcome obstacles to their creative process, whether they be environmental, social status or physical disability. Each chapter-essay is a study of how the sensibility of each creative person is the fuel energizing the machinery of artistic endeavors.

Johnson's third concept stresses the methodologies of each person's creative expression. For example, in Chapter 10 on Mark Twain, he analyzes the creative methods that led to Twain's artistic achievements, particularly how the tone of his humor was affected by story telling. Johnson also describes how Twain used the vernacular patterns of his characters; hence these speech patterns gave his writings a sense of veracity. Twain's performances as a humorist represented the Method Acting of his time. He was a genius of the one-line joke that packed both an emotional and intellectual wallop. By using a humorous posture, he was able to make his audience and his readers accept the social satire contained within his caustic statements.

The author's final chapter (Metaphors in a Laboratory) is an explanation of the creative aspects of scientific thinkers. He describes scientific concepts as being metaphors. For example: ". . . By introducing the word 'bonding,' with a range of metaphorical images flowing from it, Woodward [famous organic chemist, 1917-79] was able to formulate the patterns governing the way electrons shifted in chemistry. What are now known as the orbital symmetry rules were a double product of metaphor, first in Woodward's mind, where bonding was a master metaphor, and then in his linked colored balls, which formed his chief metaphorical laboratory tools. . . ." (**Creators**, 2006, p. 280, HarperCollins) He also explains aspects of the scientific-experimental method in creative terms. Scientific hypothesis-making, he says is like story-telling. What is most important of all is that Johnson's book is both informative and fun to read – a true example of an enjoyable reading experience.